Harvatek Surface Mount CHIP LEDs Data Sheet
Model: HT-SV114BP

Introduction

- *The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by HARVATEK for any infringements of intellectual property or other rights of the third parties which may result from it use.*
- *HARVATEK is continually making an effort to improve the quality of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing HARVATEK products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such HARVATEK products cause loss of human life, bodily injury or damage to property.*
- *The HARVATEK products listed in this document are intended for usage in general electronics (computer, personal equipment, office equipment, industrial robotics, domestic, etc…) These products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury.*
- *In developing your designs, please ensure that HARVATEK products are used within specified operating ranges as set forth in the most recent HARVATEK products specifications.*
- *Also, please keep in mind the precautions listed in this document.*

Product Specification

	Specification	Material	Quantity
Iv	800-1350mcd @20mA/ Ta= 25^{O} C Tolerance: ± 10%		
Chromaticity Coordinates	Refer to page 8 @20mA/ Ta= 25^{O} C Tolerance: ± 0.01		
Vf	2.9~3.7V (0.1V/BIN) @20mA/ Ta= 25^{O} C Tolerance: ± 0.05V		
Resin	Yellow	Silicone resin	
Carrier tape	According to EIA 481-1A specs	Conductive black tape	2000pcs per reel
Reel	According to EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel one bag
Carton	HT standard	Paper	Non-specified
	Specification	Material	Quantity

Others:

Every mid-box will be loaded 5 reels. These 5 reels can be different in lot, Iv, lambda, or Vf. Every reel will have an independent label to identify its specification and the mid-box there will have a corresponding label post on it.

ATTENTION: Electricstatic Discharge (ESD) protection

The symbol shown on the page herein to introduce 'Electro-Optical Characteristics'. ESD protection for GaP and AlGaAs based chips is still necessary even though they are safe in low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD protection has to considered and taken in the initial design stage.

If manual work/process is needed, please ensure the device is well protected from ESD during all the process.

Product Characteristics

Electro-Optical Characteristics

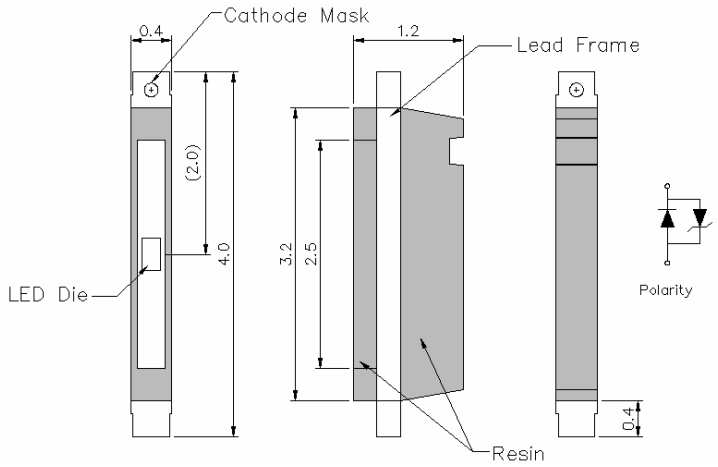
(I_F @ 20mA, T_a 25°C)

Product No.	Lighting Color	Material	V_F(V)		λ (nm)			I^*_V(mcd)
			min	max	λ_D	λ_P	△λ	Typ.
HT-SV114BP	White	InGaN	2.9	3.7	X=0.30 Y=0.31	--	--	1200

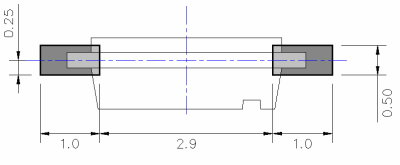
Package Outline Dimension

Unit: mm Tolerance: +/-0.1

Outline Dimension：



Soldering Pattern



Unit: mm

1. Soldering terminal may shift in x, y direction.

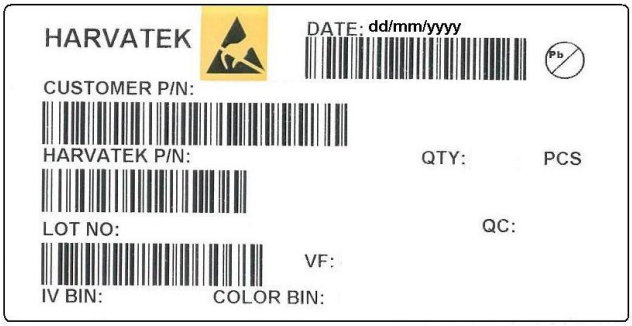
Absolute Maximum Ratings

(T_a 25°C)

Series	P_d (mW)	I_F (mA)	**I_{FP} (mA)	ESD(V)	T_{OP} (°C)	T_{ST} (°C)
HT-SV114BP	111	30	100	-8000	-40~+85	-40~+100

** Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width.

Label Spec.



■**Customer P/N: To Be Defined**

■ **Harvatek P/N**

H T - SV 1 1 4 B P

Series Name	Emitting Color
HT-SV114: 4.0x1.2x0.4mm	BP: White @20mA

■ **Lot No.**

1	2	3	4	5	6	7	8	9	10
P	**1**	**2**	**2**	**3**	**0**	**A**	**-**	**D**	**T**

Code 1	Code 2	Code 3	Code 4, 5	Code 6, 7	Code 9	Code 10
	Mfg. Year	Mfg. Month	Mfg. Date	Lots	Resin Color	Packaging
Internal Tracing Code	1: 2001 2: 2002 3: 2003 4: 2004 …..	1: Jan. 2: Feb. …. 9: Sep. A: Oct. B: Nov. C: Dec.	1~31/ (30)	01~99, A,B,C…	D: Milky White	T: Taped Reel

Bin Code.

■ Iv Bin:

Bin	Iv (mcd)	
	Min.	Max.
X21	800.00	850.00
X22	850.00	900.00
Y11	900.00	950.00
Y12	950.00	1000.00
Y21	1000.00	1050.00
Y22	1050.00	1125.00
Z11	1125.00	1200.00
Z12	1200.00	1270.00
Z21	1270.00	1350.00

Luminous Intensity Measurement Allowance is ±10%

■ Color Bin:

AU1	X	Y	AU2	X	Y	BU1	X	Y	BU2	X	Y
1	0.26	0.22	1	0.27	0.23	1	0.28	0.24	1	0.29	0.25
2	0.27	0.23	2	0.28	0.24	2	0.29	0.25	2	0.3	0.26
3	0.27	0.24	3	0.28	0.25	3	0.29	0.26	3	0.3	0.27
4	0.26	0.23	4	0.27	0.24	4	0.28	0.25	4	0.29	0.26
AA1	**X**	**Y**	**AA2**	**X**	**Y**	**BB1**	**X**	**Y**	**BB2**	**X**	**Y**
1	0.26	0.23	1	0.27	0.24	1	0.28	0.25	1	0.29	0.26
2	0.27	0.24	2	0.28	0.25	2	0.29	0.26	2	0.3	0.27
3	0.27	0.25	3	0.28	0.26	3	0.29	0.27	3	0.3	0.28
4	0.26	0.24	4	0.27	0.25	4	0.28	0.26	4	0.29	0.27
CC1			**CC2**			**DD1**			**DD2**	**X**	**Y**
1	0.26	0.24	1	0.27	0.25	1	0.28	0.26	1	0.29	0.27
2	0.27	0.25	2	0.28	0.26	2	0.29	0.27	2	0.3	0.28
3	0.27	0.26	3	0.28	0.27	3	0.29	0.28	3	0.3	0.29
4	0.26	0.25	4	0.27	0.26	4	0.28	0.27	4	0.29	0.28
EE1			**EE2**			**FF1**			**FF2**		
1	0.26	0.25	1	0.27	0.26	1	0.28	0.27	1	0.29	0.28
2	0.27	0.26	2	0.28	0.27	2	0.29	0.28	2	0.3	0.29
3	0.27	0.27	3	0.28	0.28	3	0.29	0.29	3	0.3	0.3
4	0.26	0.26	4	0.27	0.27	4	0.28	0.28	4	0.29	0.29

AUL			AAL			CCL			EEL		
1	0.25	0.21	1	0.25	0.22	1	0.25	0.23	1	0.25	0.24
2	0.25	0.22	2	0.25	0.23	2	0.25	0.24	2	0.25	0.25
3	0.26	0.23	3	0.26	0.24	3	0.26	0.25	3	0.26	0.26
4	0.26	0.22	4	0.26	0.23	4	0.26	0.24	4	0.26	0.25
GG1			GG2			**HH1**			HH2		
1	0.26	0.26	1	0.27	0.27	1	0.28	0.28	1	0.29	0.29
2	0.26	0.27	2	0.27	0.28	2	0.28	0.29	2	0.29	0.3
3	0.27	0.28	3	0.28	0.29	3	0.29	0.3	3	0.3	0.31
4	0.27	0.27	4	0.28	0.28	4	0.29	0.29	4	0.3	0.3
BT3			BU3			BB3			DD3		
1	0.3	0.25	1	0.3	0.26	1	0.3	0.27	1	0.3	0.28
2	0.3	0.26	2	0.3	0.27	2	0.3	0.28	2	0.3	0.29
3	0.31	0.27	3	0.31	0.28	3	0.31	0.29	3	0.31	0.3
4	0.31	0.26	4	0.31	0.27	4	0.31	0.28	4	0.31	0.29
BT4			BU4			BB4			DD4		
1	0.31	0.26	1	0.31	0.27	1	0.31	0.28	1	0.31	0.29
2	0.31	0.27	2	0.31	0.28	2	0.31	0.29	2	0.31	0.3
3	0.32	0.28	3	0.32	0.29	3	0.32	0.3	3	0.32	0.31
4	0.32	0.27	4	0.32	0.28	4	0.32	0.29	4	0.32	0.3
FF3			HH3			FF4			HH4		
1	0.3	0.29	1	0.3	0.3	1	0.31	0.3	1	0.31	0.31
2	0.3	0.3	2	0.3	0.31	2	0.31	0.31	2	0.31	0.32
3	0.31	0.31	3	0.31	0.32	3	0.32	0.32	3	0.32	0.33
4	0.31	0.3	4	0.31	0.31	4	0.32	0.31	4	0.32	0.32

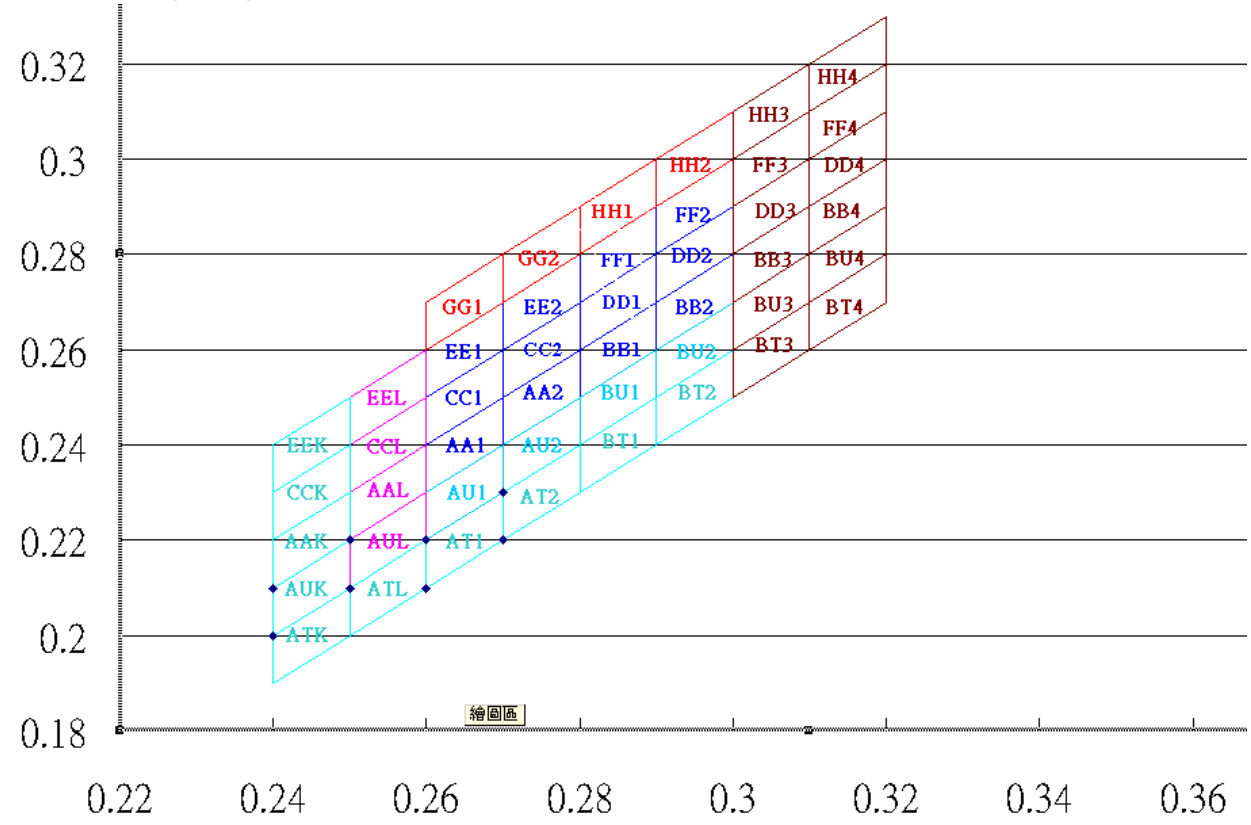
Color Coordinates Measurement Allowance is ±0.01

■ **Vf Bin:**

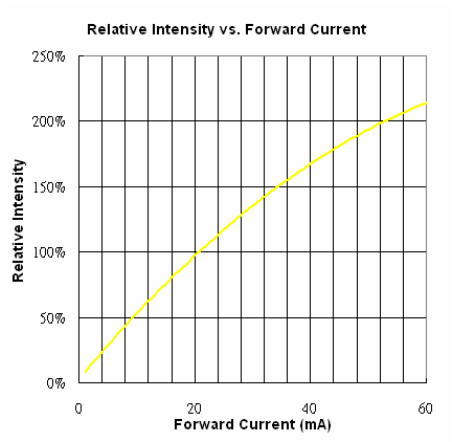
Color	Bin Code	Spec. Range
	H2	2.9-3.0V
	H3	3.0-3.1V
	H4	3.1-3.2V
	J1	3.2-3.3V
	J2	3.3-3.4V
	J3	3.4-3.5V
	J4	3.5-3.6V
	K1	3.6-3.7V

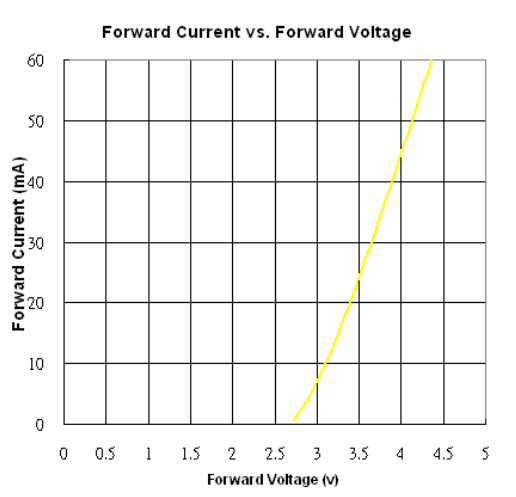
Forward Voltage Measurement Allowance is ±0.05V

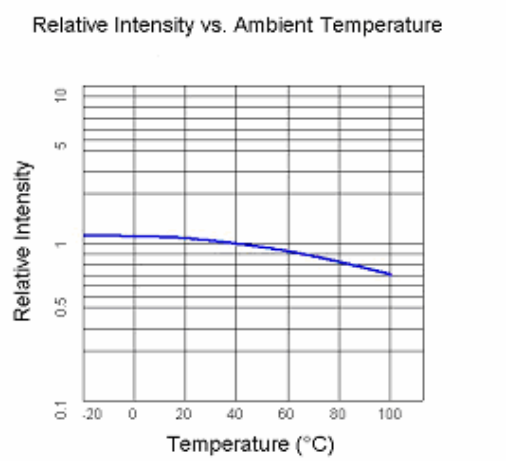
Chromaticity diagram

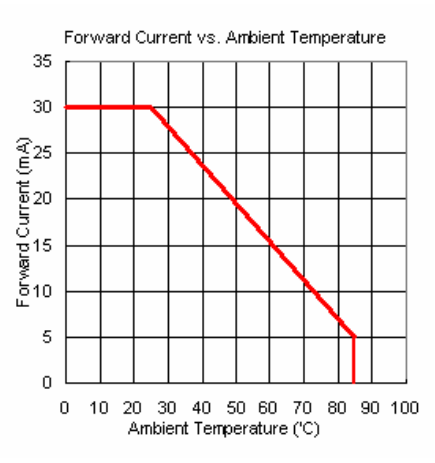


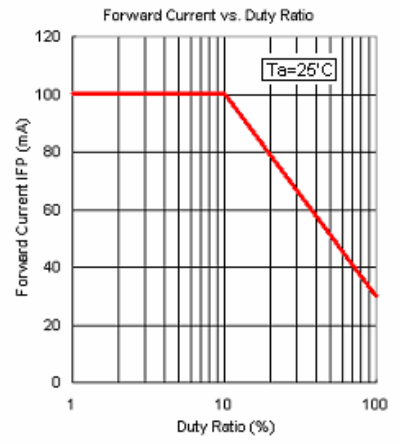
Characteristics of HT-SV114BP

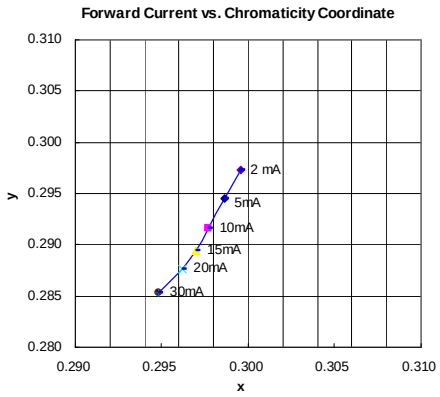


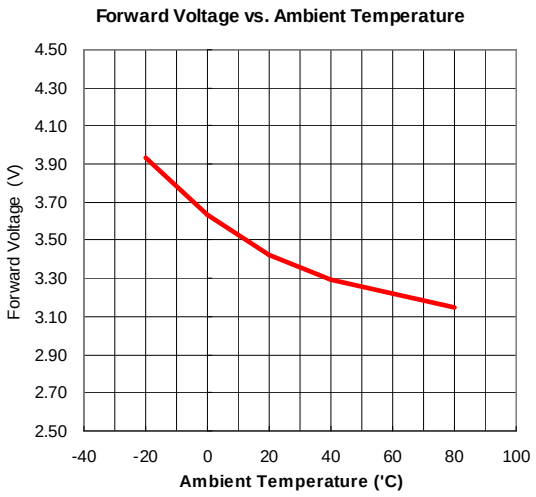


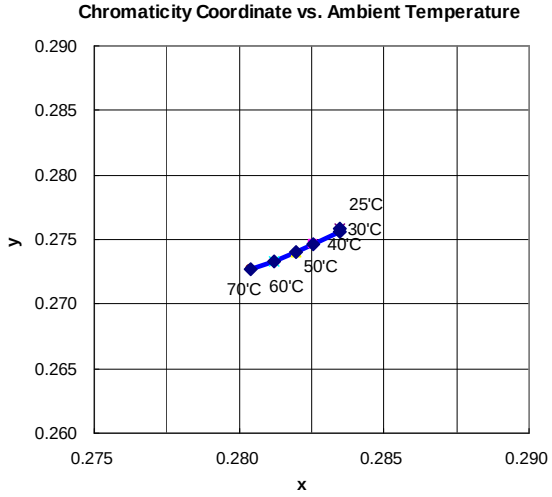


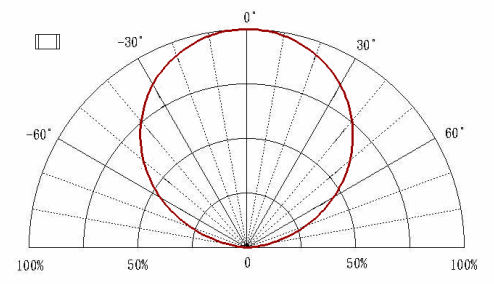


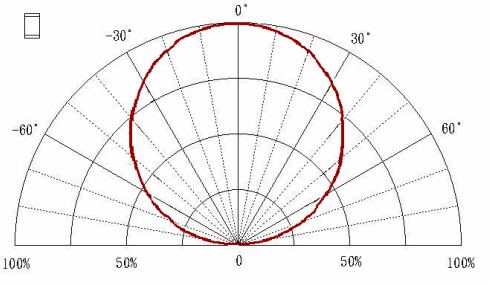






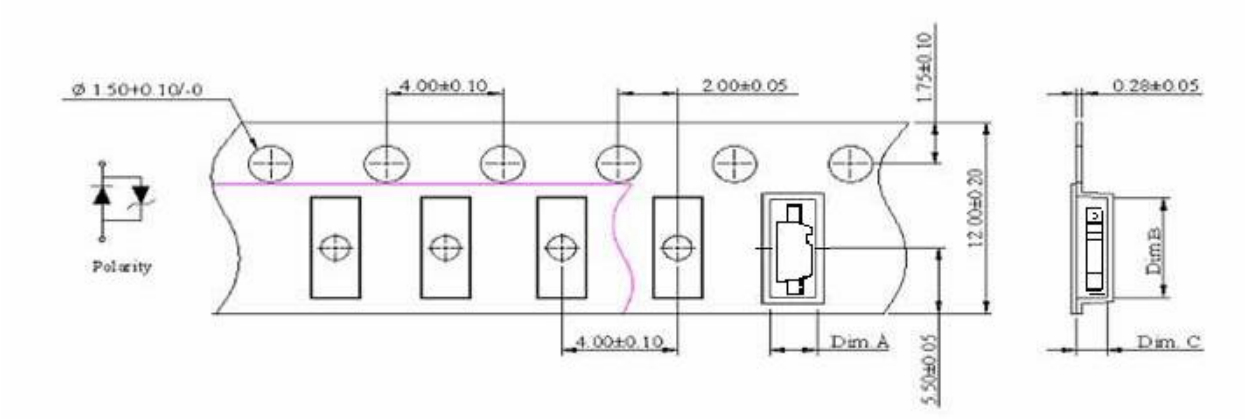






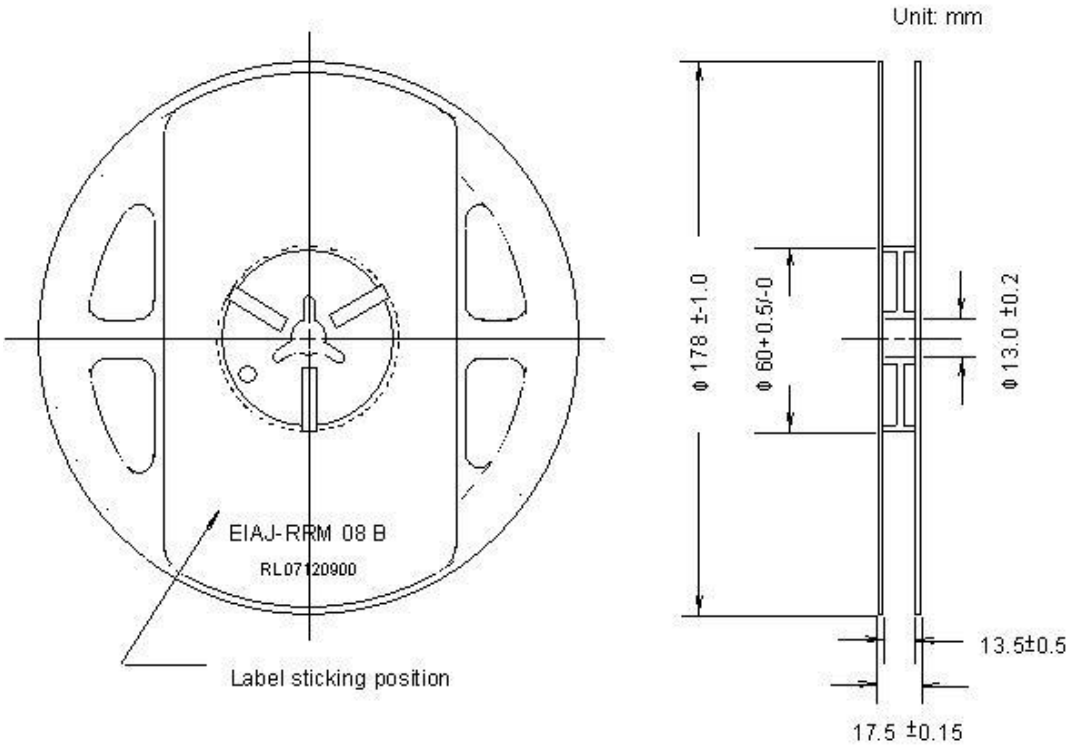
Packaging Tape, Reel, and Packing Model

Tape Dimension

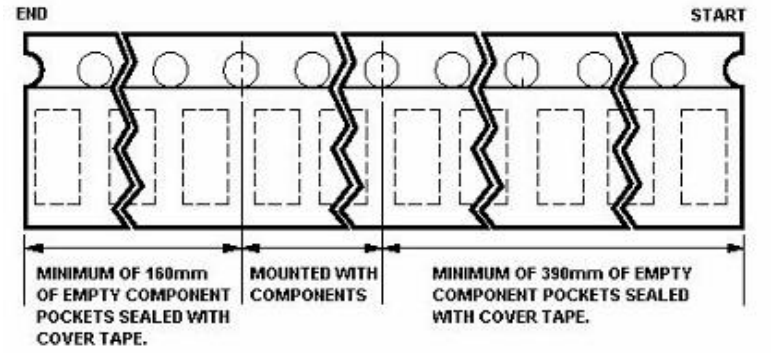


Part No.	Dim. A	Dim. B	Dim. C	Q'ty/Reel
HT-SV114	1.35±0.1	4.15±0.1	0.85±0.1	2K
				Unit:mm

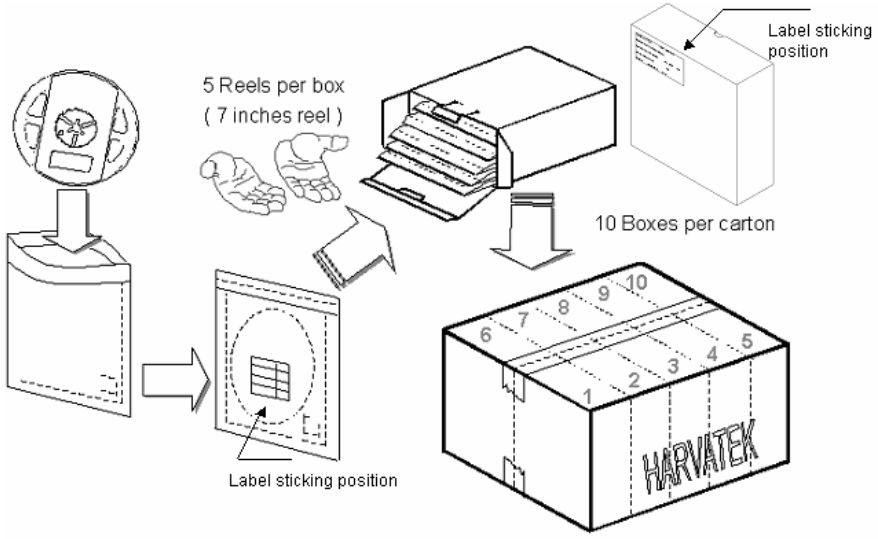
Reel Dimension



Tape Leader and Trailer Dimension



Packing Model



5 boxes per carton is available according to shipping quantity.

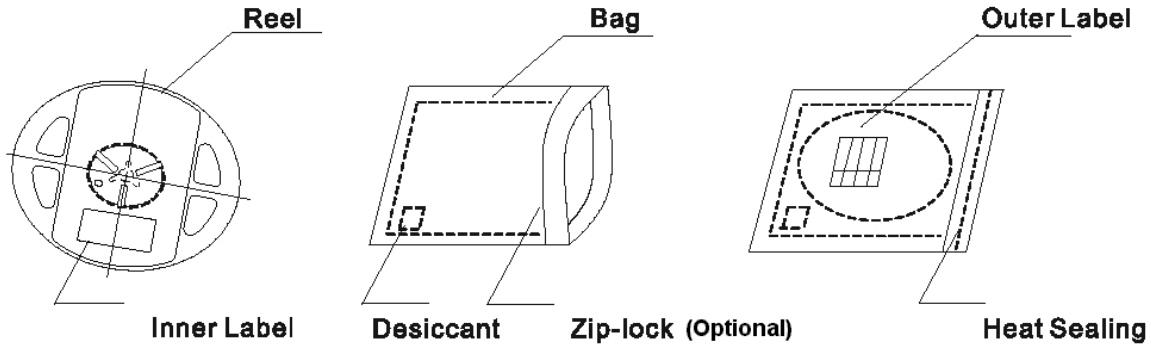
Cardboard Box Size	Dimensions(cm)	Reel/box	Quantity/box (pcs)
Small	45 x 26 x 30	25 reels Max.	50, 000 Max
Large	50 x 46 x 30	50 reels Max.	100, 000 Max

Dry Pack

Any SMD optical device, like this chip LED, is **MOISTURE SENSITIVE device**. Avoid absorbing moisture at any time during transportation or storage. Every reel will be packaged in the moisture barrier anti-static bag (Specific bag material will depend upon customers' requirement or option). And the bag is well sealed before shipment.

By customer's requirement, we will put a humidity indicator in each moisture barrier anti-static bag before shipment.

The package is the following:



Cautions of Pick and Place

It should be avoided to load stress on the resin during high temperature.

Avoid rubbing or scraping the resin by any object.

Electric-static may cause damage to the component. Please confirm that the equipment grounding well. Using an ionizer fan is recommended.

PRECAUTIONS

1. Avoid absorbing moisture at any time during transportation or storage.
2. Anti-Static process is needed especially when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a proper series current limit resistor. Avoid driving reverse voltage over the specification of LEDs when turning the unit ON/OFF.
4. Any application should refer to the specifications of absolute maximum ratings.
5. Avoid any direct contact with the viewing area.
6. If possible, assemble the unit in a clean room or dust-free environment.

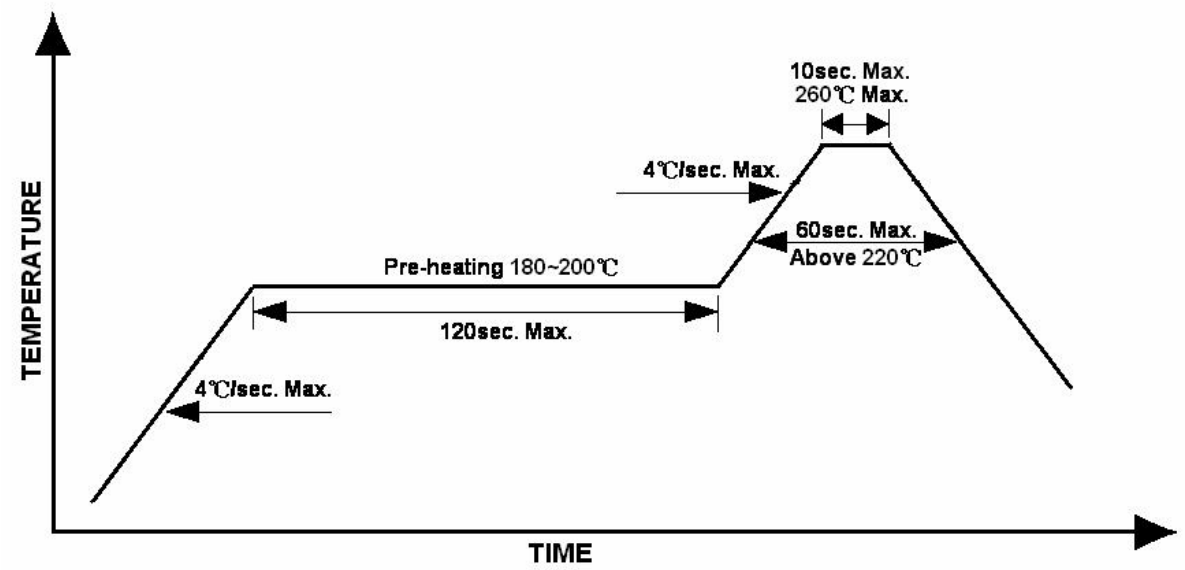
Soldering pattern

The dimensions of the recommended soldering pattern may not meet every user. Please confirm and study first before designing the soldering pattern in order to obtain the best performance of soldering. Recommended soldering pattern is listed before (page 5).

Re-flow Soldering

- Recommend tin glue specifications:
  Melting temperature: 178~192 ^{O}C
- Never take next process until the component is cooled down to room temperature after re-flow.
- The recommended re-flow soldering profile (measuring on the surface of the LED resin) is following:

Lead-free Solder



Rework

- Customer must finish rework within 3 sec. under 350 ^{O}C.
- The head of iron cannot touch copper foil.
- Twin-head type is preferred.

Cleaning

The conditions of cleaning after soldering:

An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.

Temperature×Time: <50 ^{O}C×30sec, or <30 ^{O}C×3min

Ultra sonic cleaning: < 15W/ bath; Bath volume: 1liter max.

Curing: 100 ^{O}C max, <3min

Do not contact with component on the assembly board.

Reliability

Test Items and results

Item	Frequency/ lots/ samples/ failures	Standards Reference	Conditions
Precondition	For all reliability monitoring tests according to JEDEC Level 2	J-STD-020	1.) Baking at 85°C for 24hrs 2.) Moisture storage at 85°C/ 60% R.H. for 168hrs
Solderability	1Q/ 1/ 20/ 0	JESD22-B102-B And CNS-5068	Accelerated aging 155°C/ 24hrs Tinning speed: 2.5±0.5cm/s Tinning: A: 235°C/ 3±1s or B: 260°C/ 10±1s
Resistance to Soldering heat	1Q/1/100/0	JESD22-A113	3x IR-reflow-soldering according to soldering profile
Operating life test	1Q/ 1/ 40/ 0	CNS-11829	1.) Precondition: 85°C baking for 24hrs 85°C/ 60%R.H. for 168hrs 2.) T_{amb}25°C; I_F=20mA; duration 1000hrs
High humidity, high temperature bias	1Q/ 1/ 40/ 0	JESD-A101-B	T_{amb}: 85°C Humidity: 85% R.H., I_F=5mA Duration: 1000hrs
High temperature bias	1Q/ 1/ 40/0	HT specs.	T_{amb}: 55°C I_F=20mA Duration: 1000hrs
Pulse life test	1Q/ 1/ 40/ 0	HT specs.	T_{amb}25°C, I_f=20mA,, I_p=100mA, Duty cycle=0.125 (tp=125 μs,T=1sec) Duration 500hrs)
Temperature cycle	1Q/ 1/ 100/ 0	JESD-A104-A IEC 68-2-14, Nb	A cycle: -40 degree C 15min; +85 degree C 15min Thermal steady within 5 min. 300 cycles 2 chamber/ Air-to-air type
High humidity storage test	1Q/ 1/ 40/ 0	CNS-6117	60±3°C 90+5/-10% R.H. for 500hrs
High temperature storage test	1Q/ 1/ 40/ 0	CNS-554	100±10°C for 500hrs
Low temperature storage test	1Q/ 1/ 40/ 0	CNS-6118	-40±5°C for 500hrs

Criteria for Judging the Damage

Item	Symbol	Test Condition	Criteria for Judgement	
			Min.	Max.
Forward Voltage	Vf	I_F = 20mA	-	U.S.L* x 1.2
Luminous Intensity	Iv	I_F = 20mA	L.S.L.**x 0.5	-

* U.S.L.: Upper standard level

** L.S.L.: Lower standard level